

PATENT COOPERATION TREATY
PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)
(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference AY/2004.1628	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/SG2004/000417	International filing date (<i>day/month/year</i>) 17 December 2004	Priority date (<i>day/month/year</i>) 19 December 2003
International Patent Classification (IPC) or national classification and IPC Int. Cl. C07K 14/46 (2006.01) C07K 17/00 (2006.01) G01N 33/68 (2006.01) ACTION DATE: 28 March 2006		
Applicant AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH et al		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☐ (*sent to the applicant and to the International Bureau*) a total of sheets, as follows:


☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/>	Box No. I	Basis of the report
<input type="checkbox"/>	Box No. II	Priority
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/>	Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/>	Box No. VI	Certain documents cited
<input type="checkbox"/>	Box No. VII	Certain defects in the international application
<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application

Date of submission of the demand 18 October 2005	Date of completion of this report 28 March 2006
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer <div style="text-align: center;">  O.L. CHAI Telephone No. (02) 6283 </div>

Box No. I **Basis of the report**1. With regard to the **language**, this report is based on:☒ The international application in the language in which it was filed☐ A translation of the international application into _____, which is the language of a translation furnished for the purposes of:☐ international search (under Rules 12.3(a) and 23.1 (b))☐ publication of the international application (under Rule 12.4(a))☐ international preliminary examination (Rules 55.2(a) and/or 55.3(a))2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):☒ the international application as originally filed/furnished☐ the description:

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☐ the claims:

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pages* as amended (together with any statement) under Article 19

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☐ the drawings:

pages as originally filed/furnished

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☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.3. ☐ The amendments have resulted in the cancellation of:☐ the description, pages☐ the claims, Nos.☐ the drawings, sheets/figs☐ the sequence listing (*specify*):☐ any table(s) related to the sequence listing (*specify*):4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).☐ the description, pages☐ the claims, Nos.☐ the drawings, sheets/figs☐ the sequence listing (*specify*):☐ any table(s) related to the sequence listing (*specify*):

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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1. Statement

Novelty (N)	Claims 1-49	YES
	Claims	NO
Inventive step (IS)	Claims 4-14, 16, 18-19, 32-44	YES
	Claims 1-3, 15, 17, 20-31, 45-49	NO
Industrial applicability (IA)	Claims 1-49	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

The following documents identified in the International Search Report have been considered for the purposes of this report:

- D1 Protein Expression and Purification 24, pp 282-291 (2002)
- D2 J Biological Chem 268, pp 1479-1487 (1993)
- D3 Avian Diseases 47, pp 1486-1490 (Oct 2003)
- D4 J Biological Chem 275, pp 18965-18994 (2000)
- D5 J Biological Chem. 276, pp 9910-9916 (2001)
- D6 Applied and Environmental Microbiology 68, pp 1817-1826 (2002)
- D7 WO 2002/083725
- D8 WO 2003/048783

Novelty (N)

The present invention relates to a device for the separation of proteins, particularly a protein separation device comprising a chaperone protein immobilised on a substrate. The proteins include common heat shock proteins (hsp) such as hsp 60 (also referred to as GroEL).

None of the cited documents disclose all of the features of each of the independent claims. Therefore all of the claims are novel with regards to Article 33(2) of the PCT.

Inventive Step (IS)

D2 discloses immobilised Hsp90 on a Affi-Gel beads column retained certain proteins and these proteins can be isolated and identified. Given this citation, a person skilled in the art would be led directly to use this information for separation of associated proteins. Therefore, claims 1-3, 15, 17, 20-31, 45-49 are not inventive with regards to Article 33(3) of the PCT.

Industrial Applicability (IA)

The invention defined in the claims is considered to meet the requirements of Industrial Applicability under Article 33(4) of the PCT because it can be made by, or used in, industry.

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Claim 1 is not fully supported by the description. Claim 1 recites a protein separation device comprising a chaperone protein immobilized on a substrate. However, the nature of the chaperone protein recited in claim 1 is not limited to the disclosure in the specification, mainly hsp60 or GroEL.
Similarly, claims 45-49 are not fully supported by the description.
2. Claim 32 is not clear. This claim is merely defined by result and not by any technical feature. It is not clear what form the GroEL must adopt to produce the desired results.
3. Claim 36 is not clear in scope and not fully supported by the description. It is not clear how the specificity is achieved or what the "particular protein" is. There is no substantial support in the description for such a broad claim.
4. Claim 43 is not clear in scope and not fully supported by the description. This claim has the features of claims 32 and 36 and comments in items 2-3 above therefore apply to this claim.
5. Claim 44 is not clear in scope and not fully supported by the description. This claim is merely defined by result and not by any technical feature. It is not clear what form the GroEL must adopt to produce the desired results. It is also not clear how the specificity is changed to that of another chaperone protein. There is no substantial support in the description for such a broad claim.